

Amendments to the Claims

1. (ORIGINAL) A method of determining the value of a reflection coefficient to be used in estimating range in a radio ranging system, comprising transmitting an omnidirectional signal, spatially sampling received back scatter, deriving from a scaled, received radar signal bounds of at least one reflection coefficient used in estimating range, spectral analysing the signal power density of a received signal to determine the number of specular reflections and values of the corresponding reflection coefficients, and matching the bounds of the at least one reflection coefficient with the spectral coefficient values derived from the spectral analysis of the signal power of the received signal and using the spectral coefficient values to reduce the bounds of the at least one reflection coefficient to a more precise value.

2. (ORIGINAL) A method of determining the value of a reflection coefficient to be used in estimating range in a radio ranging system, comprising transmitting an omnidirectional signal, spatially sampling received back scatter, scaling received radar back scatter to derive a bound of at least one parameter of multipath reflection, deriving a power versus distance profile at the receiver, Fourier Transforming the power versus distance profile to a spatial versus frequency domain spectrum, noting non-zero frequency spectral peaks in the spatial versus frequency domain spectrum due to specular reflections, matching the bound of the at least one parameter of multipath reflection with reflection coefficients derived from spectral analysis of the power versus spatial frequency domain to obtain more precise values of the at least one parameter and using a plurality of multipath components predicted from the signal power density.

3. (ORIGINAL) A method as claimed in claim 2, characterised in that the spatial sampling is effected using a plurality of spatially separated antennas.

4. (CURRENTLY AMENDED) A method as claimed in ~~claim 2~~ or claim 2, characterised in that the bounds of at least two parameters are derived.

5. A method as claimed in claim 4, characterised in that the at least two parameters are amplitude (a_n) and time delay (τ_n).

6. (ORIGINAL) A method of estimating range using a plurality of parameters, comprising transmitting an omnidirectional signal, spatially sampling received back scatter, deriving from a scaled, received radar signal bounds of at least one reflection coefficient used in estimating range, spectral analysing the signal power density of a received signal to determine the number of specular reflections and values of the corresponding reflection coefficients, matching the bounds of the at least one reflection coefficient with the spectral coefficient values derived from the spectral analysis of the signal power of the received signal, using the spectral components to reduce the bounds of the at least one reflection coefficient to a more precise value and using a plurality of multipath components predicted from the signal power density for parameter estimation.

7. (ORIGINAL) A method of estimating range using a plurality of parameters, at least one of the parameters being determined by transmitting an omnidirectional signal, spatially sampling received back scatter, scaling received radar back scatter to derive a bound of at least parameter of multipath reflection, deriving a power versus distance profile, Fourier Transforming the power versus distance profile to a spatial versus frequency domain, noting non-zero frequency spectral peaks in the spatial versus frequency domain spectrum due to specular reflections, matching the bound of the at least parameter of multipath reflection with reflection coefficients derived from spectral analysis of the power versus spatial frequency domain to obtain more precise values of the at least one parameter and using a plurality of multipath components predicted from the signal power density for parameter estimation.

8. (ORIGINAL) A method as claimed in claim 7, characterised in that the bounds of at least two parameters are derived.

9. (CURRENTLY AMENDED) A method as claimed in ~~any one of claims 7 or 8~~claim 7, characterised in that received signals ($r(t)$) are estimated using an equation

$$r(t) = \sum_n^M a_n e^{j\theta_n} s(t - \tau_n) + n(t) \quad (1)$$

where a_n is amplitude,

θ_n is phase,

τ_n is time delay,

$s(t)$ is the transmitted signal,

$n(t)$ is noise and

M is the total number of specular reflections.

10. (ORIGINAL) A range measuring system comprising means for determining a plurality of parameters to be used in estimating range, said means including a transmitter for transmitting an omnidirectional signal, means for spatially sampling received back scatter, means for scaling received radar back scatter to derive a bound of at least one parameter of multipath reflection, means for deriving a power versus distance profile, means for Fourier Transforming the power versus distance profile to a spatial versus frequency domain spectrum, means for noting non-zero frequency spectral peaks in the spatial versus frequency domain spectrum due to specular reflections, means for matching the bound of the at least one parameter of multipath reflection with reflection coefficients derived from spectral analysis of the power versus spatial frequency domain to obtain more precise values of the at least one parameter, and means for determining the number of multipath components for parameter estimation.

11. (ORIGINAL) A method of determining the value of a reflection coefficient to be used in estimating range in a radio ranging system, substantially as hereinbefore described with reference to the accompanying drawings.

12. (ORIGINAL) A method of estimating range using a plurality of parameters, substantially as hereinbefore described with reference to the accompanying drawings.

13. (ORIGINAL) A range measuring system constructed and arranged to operate substantially as hereinbefore described with reference to and as shown in the accompanying drawings.